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(54) ORIGINAL FILM FOR PLANOGRAPHIC PRINTING PLATE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an original film for planographic printing plate having excellent on-press developability as well as high sensibility and good printing durability.

SOLUTION: The original film has a heat sensitive layer containing polymer particles having block isocyanate groups, a hydrophilic resin and a photothermal converting substance on a hydrophilic supporting body. The polymer particulates having the block isocyanate groups preferably contains the photothermal converting substance, furthermore it is more preferable that the hydrophilic resin has the groups to react with isocyanate.

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CLAIMS

[Claim(s)]

[Claim 1] The original edition for the lithography versions characterized by having a sensible-heat layer containing the polymer particle, the hydrophilic resin, and light-and-heat conversion matter which have a block isocyanate machine on a hydrophilic base material.

[Claim 2] The original edition for the lithography versions according to claim 1 characterized by the polymer particle which has the aforementioned block isocyanate machine containing the light-and-heat conversion matter.

[Claim 3] The original edition for the lithography versions according to claim 1 to which the aforementioned hydrophilic resin is characterized by having with an isocyanate the basis to which it reacts.

[Claim 4] The original edition for the lithography versions according to claim 1 characterized by containing an isocyanate and the compound which has the basis which reacts in [two or more] a molecule in the aforementioned sensible-heat layer.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the original edition for the lithography versions which has the sensible-heat layer of a hydrophilic property on a base material. In more detail, the platemaking by the scanning exposure and on-board development based on the digital signal is possible, and it is related with the original edition for the lithography versions which was excellent in ****-proof.

[0002]

[Description of the Prior Art] Much researches are made about the lithographic plate for computer two-plate systems with progress remarkable in recent years. As what aims at solution of much more process rationalization and a waste fluid processing problem, without carrying out a development, after exposure, the original edition for the lithography versions which equips a printing machine with as it is and which can be printed is studied, and various methods are proposed in it.

[0003] There is a method called on-board development which removes the non-picture section of the original edition for printing by supplying dampening water and ink, equipping the cylinder of a printing machine with the original edition [finishing / exposure] for the lithography versions, and rotating a cylinder to one of the methods which loses down stream processing. That is, it is the method which equips a printing machine with as it is and which processing completes in the usual printing process after exposing the original edition for printing. To have the photosensitive layer (sensible-heat layer) which can be distributed [that the original edition for the lithography versions suitable for such on-board development is melttable for dampening water or an ink component or], and to have the Ming room handling nature suitable for moreover negatives being developed on the printing machine put on the Ming room is needed.

[0004] For example, the original edition for the lithography versions which prepared the photosensitive layer which distributed the particle of a thermoplastic hydrophobic polymer in hydrophilic binder polymer on the hydrophilic base material is indicated by Japanese JP,2938397,B. After carrying out infrared-laser exposure, making this official report coalesce with heat and carrying out image formation of the particle of a thermoplastic hydrophobic polymer to it in this original edition for the lithography versions, a version is attached on a printing machine cylinder and it is indicated that on-board development can be carried out in dampening water and/or ink. Moreover, this original edition for the lithography versions also has the Ming room handling fitness, when a sensitization region is an infrared region.

[0005] Moreover, producing the printing version by on-board development after coalesce according a thermoplastic particle to heat also in JP,9-127683,A and WO No. 10186 [99 to] official report is indicated. However, although the method of making a picture from mere coalesce of the particle by the above heat showed good on-board development nature, since picture intensity was small, it had the problem that ****-proof was inadequate.

[0006] On the other hand, although the sensitive material which combined the block isocyanate with

light-and-heat conversion material was indicated by JP,62-164049,A and JP,6-1088,A, since these used the low-molecular type block isocyanate, they had sensitivity and the problem that ****-proof was inadequate. Although the photosensitive constituent containing the aquosity resin and infrared-absorption agent which have the blocked isocyanate machine was indicated by JP,2000-275834,A, when it attached without processing on the printing machine after exposing this photosensitive constituent and printing was started, the on-board development nature of the non-picture section was bad, and there was a problem that many maculatures were required.

[0007]

[Problem(s) to be Solved by the Invention] Therefore, the purpose of this invention is solving the above-mentioned problem, namely, is having good on-board development nature and offering the good original edition for the lithography versions of ****-proof by high sensitivity moreover.

[0008]

[Means for Solving the Problem] That this invention person etc. should attain the above-mentioned purpose, as a result of inquiring wholeheartedly, by having a block isocyanate machine and making a hydrophilic resin contain in a sensible-heat layer, the polymer in a particle conquered the fault of the aforementioned conventional technology, and found out the bird clapper to the original edition for the lithography versions which was excellent in on-board development nature and picture intensity. That is, this invention is as follows.

- (1) The original edition for the lithography versions characterized by having a sensible-heat layer containing the polymer particle, the hydrophilic resin, and light-and-heat conversion matter which have a block isocyanate machine on a hydrophilic base material.
- (2) The original edition for the lithography versions of the aforementioned (1) publication characterized by the polymer particle which has the aforementioned block isocyanate machine containing the light-and-heat conversion matter.
- (3) The original edition for the lithography versions of the aforementioned (1) publication to which the aforementioned hydrophilic resin is characterized by having with an isocyanate the basis to which it reacts.
- (4) The original edition for the lithography versions of the aforementioned (1) publication characterized by containing an isocyanate and the compound which has the basis which reacts in [two or more] a molecule in the aforementioned sensible-heat layer.

[0009] The original edition for the lithography versions of this invention can form a picture by scanning laser exposure based on digital exposure. With the heat generated by irradiation of laser exposure, the hydrophobic polymer particle contained in a sensible-heat layer ***** partially at least, and the blocking agent of the blocking isocyanate simultaneously contained in this polymer molecule dissociates. The polymer which has the isocyanate machine which separated produces crosslinking reaction with self-bridge formation or a hydrophilic resin, and its picture section intensity improves. From the above-mentioned result, good on-board development nature is held and the original edition for the lithography versions which was excellent in ****-proof can be offered.

[0010]

[Embodiments of the Invention] The original edition for the lithography versions of this invention is explained in detail below. The original edition for the lithography versions of this invention has the sensible-heat layer formed as mentioned above by applying the coating liquid of the constituent containing the polymer particle, the hydrophilic resin, and light-and-heat conversion matter which have a block isocyanate machine on the base (it abbreviates to a hydrophilic base material) which has a hydrophilic front face. First, each component of the sensible-heat layer which is the feature portion of the original edition for the lithography versions of this invention is explained.

[0011] (Polymer particle which has a block isocyanate machine) As a method of preparing polymer 1 particle which has the block isocyanate machine used for this invention For example, the method of creating a particle, carrying out the polymerization of the monomer like an emulsion-polymerization method, a suspension-polymerization method, and a soap free emulsion-polymerization method, and distributing in water, The polymer prepared in advance is dissolved in the organic solvent of water and a

non-miscibility, the mixed emulsification of this is carried out with the solution containing distributed liquid, heat is applied further, and there is the solvent evaporating method made into the shape of a particle, flying the organic solvent. However, it is not limited to these methods.

[0012] As a monomer used for compounding the polymer containing a block isocyanate machine As indicated by JP,9-43845,A for example, like P-phenoxy ROKISHI carbonylamino phenyl group Besides the acrylate (meta) monomer which introduced beforehand the basis which decomposes with heat and generates an isocyanate machine in the molecule 2-methacryloiloxy-ethyl isocyanate, 4-vinyl phenyl isocyanate, The monomer obtained by blocking by various block agents to the monomer which has an isocyanate machine like 2-hydroxyethyl (meta) acrylate and a diisocyanate condensate can be mentioned.

[0013] The polymer which has a blocking isocyanate machine can also be obtained by blocking an isocyanate monomer by various block agents by the macromolecule reaction after a polymerization, although it is compoundable with the polymerization of the monomer containing the above blocking isocyanates.

[0014] in addition -- a blocking reaction -- for example, a blocking agent -- hydroxyl groups, such as alcohol, a phenol, and an oxime, -- it is (general formula R-OH) -- when it reacts with an isocyanate compound (general formula R' -N=C=O), a urethane bond is formed like R-O-CO-NH-R' of an addition reaction Moreover, when reacting with an active hydrogen compound (-CH₂-) like an acetylacetone, amide combination is formed, and urea combination is formed when a blocking agent is an amino group.

[0015] This is used, and using the urethane resin which exists in a principal chain, an amide resin, and an urea resin as block isocyanate polymer, the above-mentioned combination can decompose a principal chain partially at least with heat, and can generate an isocyanate.

[0016] Although a well-known thing can be used as a blocking agent which blocks an isocyanate machine For example, a phenol, cresol, a xylanol, a naphthol, p-nitrophenol, Phenols, such as p-chlorophenol, a GUAIYA call, a catechol, and a resorcinol, Lactams, such as an epsilon caprolactam, methylethyl ketoxime, the aceto oxime, Oximes, such as a butanone oxime and a cyclohexanone oxime, 2-formyloxy ethyl (meta) acrylate, Formyloxy one, such as 2-formyloxy ethyl propionate, a methanol, Ethanol, propanol, a butanol, ethylene glycol, benzyl alcohol, Alcohols, such as a propylene glycol monomethyl ether and an isopropanol, Activity methylenes, such as an acetylacetone, an ethyl acetoacetate, and a diethyl malonate Diethylamine, diphenylamine, dibutyl-amine, aniline, N, and N-dimethylhydrazine, Amines, such as a N phenylnaphthylamine and a carbazole, an imidazole, 2-methyl imidazole, 2-ethyl imidazole, 2-phenyl imidazole, 2, 4-diamino-6 {2'-methyl imidazole (1')} ethyl-s-triazine, The blocking agent of hydrophilic properties, such as a basic nitrogen content compound, such as heterocyclic-compounds [, such as a benzotriazol,], N, and N-diethylhydroxylamine and a hydroxy pyridine, and sodium hydrogen sulfite, etc. is mentioned. Irrespective of by what method a block isocyanate machine is introduced, it is desirable for a block isocyanate to dissociate at the temperature of 80 degrees C - 200 degrees C, and to generate an isocyanate.

[0017] As for the weight average molecular weight of the polymer which has a block isocyanate machine, it is desirable that it is the range of 5,000-400,000. Moreover, a copolymer with the monomer which has the polymerization nature vinyl group which does not contain a block isocyanate machine from a viewpoint of sensitized material performances, such as heat weld nature, ink receptiveness, and ****-proof, can be used.

[0018] As a polymerization nature monomer, the maleates like acrylate (meta) acids, such as the styrene like styrene, hydroxy styrene, and a methyl styrene, an acrylic acid (meta), a methyl acrylate (meta), a butyl acrylate (meta), acrylic-acid (meta) t-butyl, acrylic-acid (meta) cyclohexyl, and acrylic-acid 2-hydroxyethyl, and (meta) acrylic esters, an acrylamide (meta), acrylonitrile, a diethyl maleate, and a maleic-acid dimethyl are mentioned, for example. It is desirable from a viewpoint of picture intensity to copolymerize the monomer which has especially an isocyanate machine and the functional group which can react, for example, a hydroxy group like acrylic-acid 2-hydroxyethyl, a carboxyl group like . (meta) acrylic acid, and an amide group like an acrylamide (meta).

[0019] Although the mean particle diameter of a polymer particle has desirable 0.01-3 micrometers, also in it, its 0.05-1.0 micrometers are still more desirable, and especially its 0.02-0.4 micrometers are desirable. In this range, good resolution and stability with the passage of time are acquired.

[0020] Moreover, 40% of the weight or more of the sensible-heat layer solid content of the addition of a polymer particle is desirable, and its 60 % of the weight or more is still more desirable. Simultaneously with good on-board development nature, good sensitivity and ****-proof are obtained in this range.

[0021] (Hydrophilic resin) What contains an isocyanate and the basis which reacts, for example, a hydroxy group, the amino group, a carboxy group, an amide group, and a sulfhydryl group as a hydrophilic resin is desirable.

[0022] As an example of a hydrophilic resin, gum arabic, casein, gelatin, a starch derivative, SOYAGAMU, hydroxypropylcellulose, a methyl cellulose, a carboxymethyl cellulose, and its sodium salt, A cellulose acetate, a sodium alginate, a vinyl acetate-maleic-acid copolymer, Styrene-maleic-acid copolymers, polyacrylic acids, and those salts, The homopolymer and copolymer of polymethacrylic acids and those salts, and hydroxyethyl methacrylate, The homopolymer and copolymer of the homopolymer of hydroxyethyl acrylate and a copolymer, and hydroxypropyl methacrylate, The homopolymer and copolymer of hydroxypropyl acrylate, The homopolymer and copolymer of hydroxy butyl methacrylate, The homopolymer of hydroxy butyl acrylate and a copolymer, and polyethylene glycols The degree of hydrolysis in hydroxy propylene polymer, polyvinyl alcohol, and a row At least 60 % of the weight, Preferably At least 80% of the weight of a hydrolysis polyvinyl acetate, The homopolymer and copolymer of a polyvinyl formal, a polyvinyl pyrrolidone, and an acrylamide, The homopolymer and copolymer of the homopolymer of methacrylamide and a copolymer, and N-methylol acrylamide, The homopolymer of a 2-acrylamide-2-methyl-1-propane sulfonic acid and a copolymer, the homopolymer of 2-METAKURO yloxy ethyl phosphonic acid and a copolymer, the poly allylamine, polyethyleneimine, etc. can be mentioned.

[0023] 5 - 70% of the solid content of a sensible-heat layer of the addition to the sensible-heat layer of a hydrophilic resin is desirable, and it is still more desirable. [5 - 40% of] Within the limits of this, good on-board development nature and a good film strength are obtained, and it is desirable.

[0024] (Light-and-heat conversion matter) The sensible-heat layer of this invention contains the light-and-heat conversion matter which absorbs infrared radiation and generates heat in order to raise sensitivity. As this light-and-heat conversion matter, various pigments, colors, and metal particles can be used that what is necessary is just the 700-1200nm optical-absorption matter which has an absorption band in part at least. When making a picture form especially by laser beam exposure, the optical-absorption matter which has an optical absorption on laser beam wavelength is desirable.

[0025] As a pigment, the pigment of the infrared-absorption nature indicated by a commercial pigment and a Color Index (C. I.) handbook, the "newest pigment handbook" (volume on Japanese pigment technical association, 1977 annual publications), the "newest pigment applied technology" (CMC publication, 1986 annual publications), and "printing ink technology" (CMC publication, 1984 annual publications) can be used.

[0026] Since these pigments raise the dispersibility over the layer added, well-known surface treatment can be performed and used for them if needed. In the method of surface treatment, the method of carrying out the surface coat of a hydrophilic resin or the lipophilic property resin, the method to which a surfactant is made to adhere, the method of combining the active substance (for example, a silica sol, an alumina sol, a silane coupling agent, an epoxy compound, an isocyanate compound, etc.) with a pigment front face, etc. can be considered. The pigment added in the layer of a hydrophilic property has that desirable to which the coat of the front face was carried out by the hydrophilic resin or the silica sol so that it may be easy to distribute with a water-soluble resin and a hydrophilic property may not be spoiled. As for the particle size of a pigment, it is desirable that it is in the range of 0.01 micrometers - 1 micrometer, and it is still more desirable that it is in the range which is 0.01 micrometers - 0.5 micrometers. As a method of distributing a pigment, the well-known distributed technology used for ink manufacture, toner manufacture, etc. can be used. As a desirable pigment, carbon black can be mentioned especially.

[0027] as a color, the well-known color indicated by a commercial color and reference (for example, development of the functionality coloring matter of the 90s, and the "near-infrared absorption coloring matter" "commercial-scene trend" chapter 2 2.3rd term (1990) -- CMC), or the patent can be used [of "color handbook" Society of Synthetic Organic Chemistry, Japan edit, Showa 45 annual publications, and "chemical-industry" 1986 year 5 month number P.45-51] Specifically, infrared-absorption colors, such as azo dye, metallic complex azo dye, pyrazolone azo dye, an anthraquinone dye, a phthalocyanine dye, a carbonium color, a quinonimine dye, the poly methine dye, and cyanine dye, are desirable.

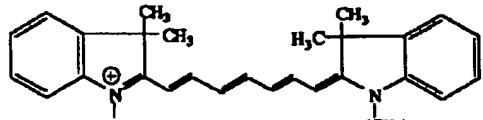
[0028] Furthermore, for example, JP,58-125246,A, JP,59-84356,A, Cyanine dye, JP,58-173696,A which are indicated by JP,60-78787,A etc., The methine dye indicated by JP,58-181690,A, JP,58-194595,A, etc., JP,58-112793,A, JP,58-224793,A, JP,59-48187,A, The naphthoquinone color indicated by JP,59-73996,A, JP,60-52940,A, JP,60-63744,A, etc., The SUKUWARIRIUMU color indicated by JP,58-112792,A etc., Cyanine dye given in British JP,434,875,B, and a color given in U.S. Pat. No. 4,756,993, Cyanine dye given in U.S. Pat. No. 4,973,572, a color given in JP,10-268512,A, and a phthalocyanine compound given in JP,11-235883,A can be mentioned.

[0029] Moreover, a near-infrared absorption sensitizer given in U.S. Pat. No. 5,156,938 is also suitably used as a color. Moreover, the ARIRUBENZO (thio) pyrylium salt by which the U.S. Pat. No. 3,881,924 publication was replaced, TORIME tin thia pyrylium salt given in JP,57-142645,A, JP,58-181051,A, 58-220143, 59-41363, 59-84248, The pyrylium system compound indicated by 59-84249, 59-146063, and 59-146061, Pentamethine thio pyrylium salt etc. and JP,5-13514,B given in cyanine dye given in JP,59-216146,A, and U.S. Pat. No. 4,283,475, the pyrylium compound currently indicated by the 5-19702 official report and the product made from EPORIN -- EPORAITO III-178, EPORAITO III-130, and EPORAITO III-125 grade are also used preferably A color desirable in these, although it adds in the hydrophilic matrix of the hydrophilic resin middle class of a sensible-heat layer is a water soluble dye, and shows an example below. However, this invention is not limited to these.

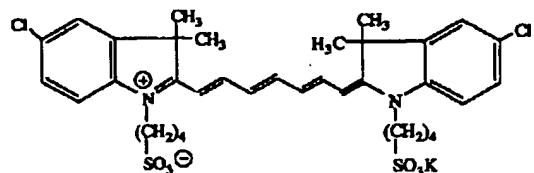
[0030]

[Formula 1]

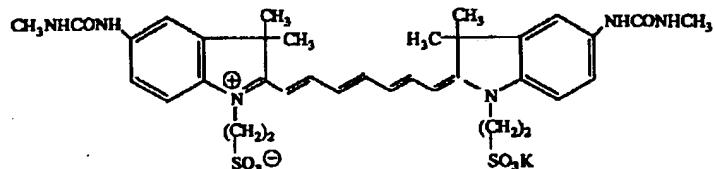
(IR-1)



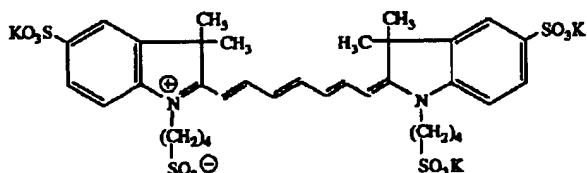
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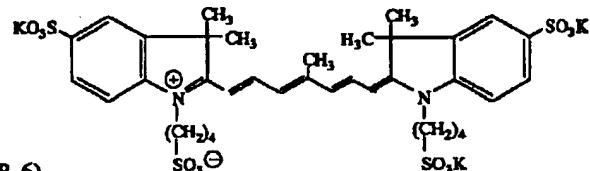
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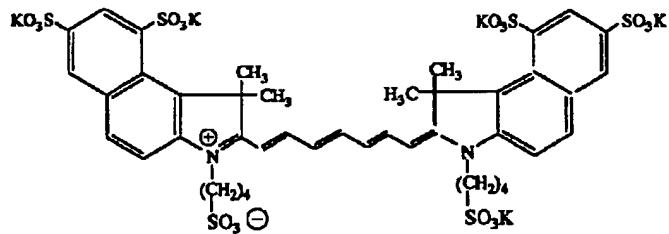
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(IR-5)

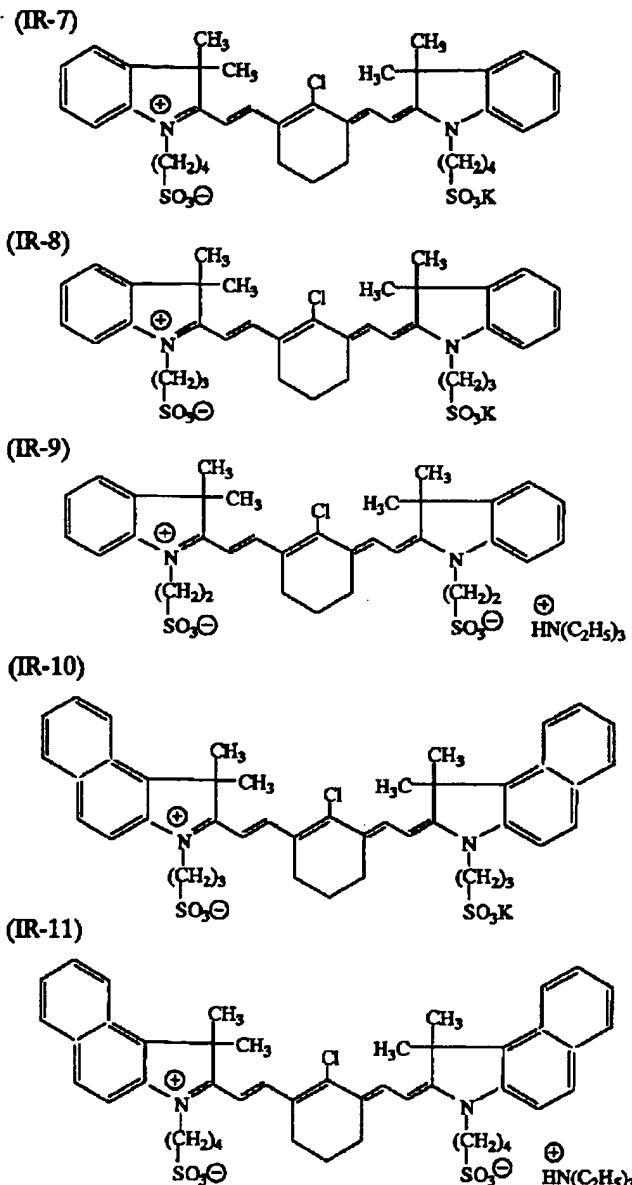


(IR-6)



[0031]

[Formula 2]

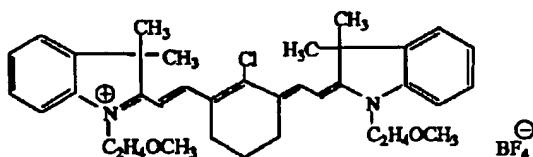


[0032] Make it moreover, more desirable from the point of sensitivity and picture intensity to contain a light-and-heat conversion agent in the polymer particle used for a sensible-heat layer. Although you may be the aforementioned infrared-absorption color as a light-and-heat conversion agent made to contain in a polymer particle, the color of lipophilic property is more desirable. The following colors can be mentioned as an example.

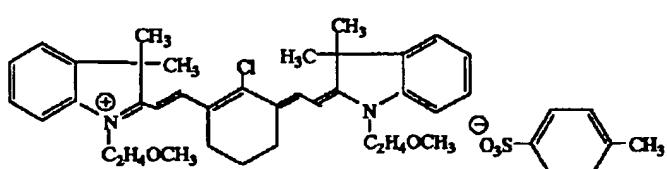
[0033]

[Formula 3]

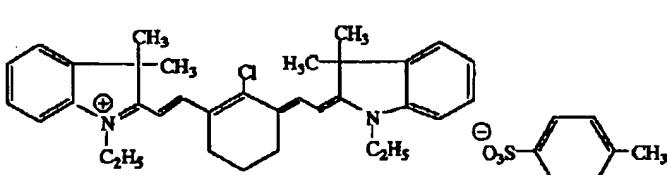
(IR-21)



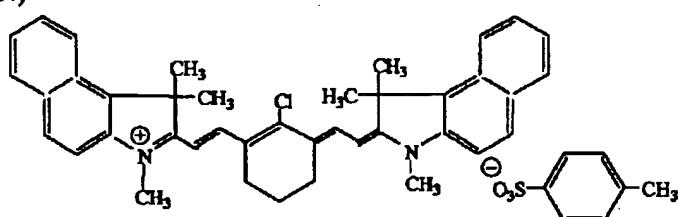
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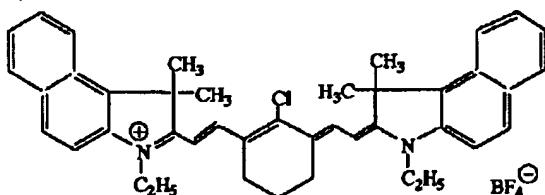
(IR-23)



(IR-24)



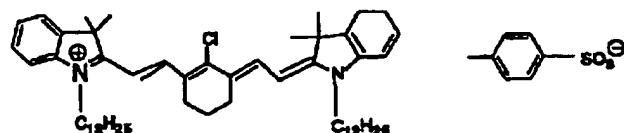
(IR-25)



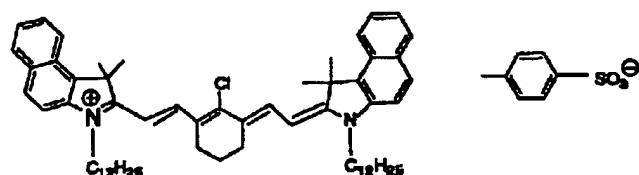
[0034]

[Formula 4]

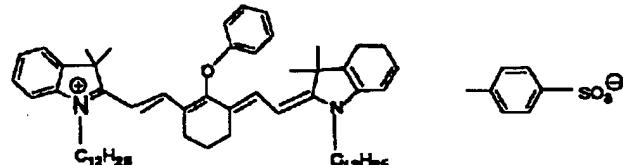
IR26



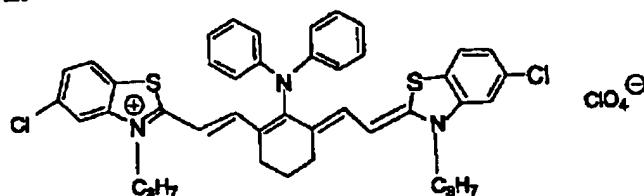
IR27



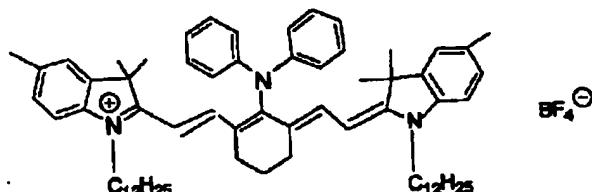
IR28



IR29

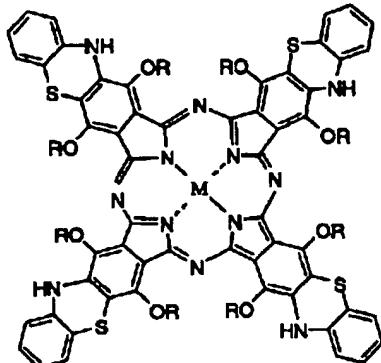


IR30

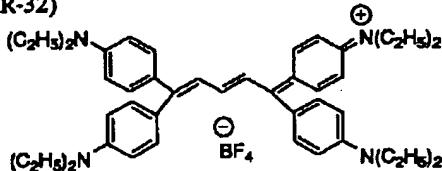


[0035]

[Formula 5]

(IR-31) M=VO, R=i-C₅H₁₁

(IR-32)



[0036] The light-and-heat conversion agent of the above-mentioned organic system can be added to 30 % of the weight in a sensible-heat layer. It is 5 - 25 % of the weight preferably, and is 7 - 20 % of the weight especially preferably. Good sensitivity is obtained within the limits of this.

[0037] A metal particle can also be used for the sensible-heat layer of this invention as a light-and-heat conversion agent. Many of metal particles are light-and-heat conversion nature, and it is also self-febrility. As a desirable metal particle, the particle of the simple substance of Si, aluminum, Ti, V, Cr, Mn, Fe, Co, nickel, Cu, Zn, Y, Zr, Mo, Ag, Au, Pt, Pd, Rh, In, Sn, W, Te, Pb, germanium, Re, and Sb, alloys or those oxides, and a sulfide is mentioned. The melting points a metal desirable also in the metal which constitutes these metal particles tends to carry out [the melting points] heat weld by optical irradiation are infrared rays and the metal which has absorption in visible or an ultraviolet-rays field, for example, Re, Sb, Te, Au, Ag, Cu, germanium, Pb, and Sn, below about 1000 degrees C. Moreover, especially a desirable thing is the particle of a metal also with comparatively high melting point and absorbance [as opposed to / it is comparatively low and / a heat ray], for example, Ag, Au, Cu, Sb, germanium, and Pb, and especially desirable elements are Ag, Au, and Cu.

[0038] Moreover, you may consist of two or more sorts of light-and-heat conversion matter, such as carrying out mixed use of the particle of low melting point metals, such as Re, Sb, Te, Au, Ag, Cu, germanium, Pb, and Sn, and the particle of self-febrility metals, such as Ti, Cr, Fe, Co, nickel, W, and germanium, for example. Moreover, when it considers as minute pieces, such as Ag, Pt, and Pd, especially the thing to use combining the minute piece of a large metal kind and other metal minute pieces has a desirable optical absorption.

[0039] The particle of the metal simple substance stated above and an alloy is a book by hydrophilic-property--ization-processing a front face. The means of the formation of a surface hydrophilic property can be hydrophilic, surface treatment can be carried out with the compound which has the adsorptivity to a particle, for example, a surfactant, surface treatment can be carried out by the constituent of a particle, and the matter with the hydrophilic radical which reacts, or methods, such as preparing the hydrophilic macromolecule coat of protective colloid nature, can be used. Especially a desirable thing is surface silicate processing, for example, in the case of an iron particle, a front face can fully be hydrophilic-property-ized by the method immersed in 70-degree C sodium-silicate (3%) solution for 30 seconds. Other metal particles can perform surface silicate processing by the same method.

[0040] 10 micrometers or less of 0.003-5 micrometers of particle size of these particles are 0.01-3

micrometers especially preferably more preferably. Within the limits of this, good sensitivity and good resolution are obtained and it is desirable.

[0041] In this invention, when using these metal particles as a light-and-heat conversion agent, the addition is 10% of the weight or more of a sensible-heat layer solid content preferably, and is especially used at 30 % of the weight or more preferably 20% of the weight or more. Within the limits of this, high sensitivity is obtained and it is desirable.

[0042] Moreover, in the sensible-heat layer of this invention, you may add various compounds further in addition to the above. For example, in order to raise ****-proof further, polyamine compounds, such as diols, such as compound which has isocyanate and functional group which reacts in [two or more] molecule, 1 [for example,], and 4-butanediol, and a diethylenetriamine, can be added.

[0043] In this invention, or it promotes the maceration at the time of heating of the block isocyanate machine which the polymer in a particle has, in order to promote the reaction of an isocyanate and functional groups, such as a hydrophilic resin and an additive, a well-known catalyst can be contained in a sensible-heat layer. Djibouti rutin JIRAUJI rate, dimethyl stannic-chloride, trimethyl tin hydroxide, stannic-chloride, tetrapod-n-butyl tin, stannous-chloride, OKUTOE acid tin, bismuth-nitrate, zinc-naphthenate, naphthenic-acid cobalt, antimony-trioxide, titanic-acid, tetramethyl butanediamine, 1, and 4-diazabicyclo [2, 2, 2] octane, a triethylamine, etc. are mentioned as an example. These combine and may be used. These can also be made to contain in a particle.

[0044] Moreover, after image formation, since distinction of the picture section and the non-picture section is made easy to attach, the color which has big absorption in a light region can be used for the sensible-heat layer of this invention as a coloring agent of a picture. Specifically Oil yellow #101, oil yellow #103, oil pink #312, the oil green BG An oil blue BOS, oil-blue #603, oil black BY, Oil black BS, oil black T-505 (above product made from Orient Chemical industry), Victoria pure blue, a Crystal Violet (CI42555), A Methyl Violet (CI42535), ethyl violet, Rhodamine B (CI145170B), Colors indicated by JP,62-293247,A, such as a Malachite Green (CI42000) and a methylene blue (CI52015), can be mentioned. Moreover, pigments, such as a phthalocyanine system pigment, an azo system pigment, and titanium oxide, can also be used suitably. 0.01 - 10 % of the weight of an addition is desirable to a sensible-heat layer application liquid total solid.

[0045] Furthermore, if needed, in order to give the flexibility of a paint film etc., a plasticizer can be added to the sensible-heat layer of this invention. For example, a polyethylene glycol, a tributyl citrate, a diethyl phthalate, dibutyl phthalate, a phthalic-acid dihexyl, a dioctyl phthalate, tricresyl phosphate, tributyl phosphate, trioctyl phosphate, a tetrahydrofurfuryl oleate, etc. are used.

[0046] The sensible-heat layer of this invention dissolves or distributes each required above-mentioned component to a solvent, prepares application liquid, and is applied. As a solvent used here, ethylene dichloride, a cyclohexanone, A methyl ethyl ketone, a methanol, ethanol, propanol, an ethylene glycol monomethyl ether, 1-methoxy-2-propanol, 2-methoxy ethyl acetate, 1-methoxy-2-propyl acetate, dimethoxyethane, a methyl lactate, Although ethyl-lactate, N, and N-dimethylacetamide, N.N-dimethylformamide, a tetramethyl urea, N-methyl pyrrolidone, dimethyl sulfoxide, a sulfolane, gamma-butyl lactone, toluene, water, etc. can be mentioned, it is not limited to this. these solvents are independent -- or it is mixed and used The solid-content concentration of application liquid is 1 - 50 % of the weight preferably.

[0047] Moreover, although the sensible-heat layer coverage on the base material obtained after an application and dryness (solid content) changes with uses, generally its 0.5 - 5.0 g/m² is desirable. Various methods can be used as a method of applying. For example, a bar coating-machine application, a rotation application, a spray application, a curtain application, a DIP application, an air knife application, a blade application, a roll application, etc. can be mentioned.

[0048] In the sensible-heat layer application liquid in connection with this invention, the surfactant for improving application nature, for example, a fluoroochemical surfactant which is indicated by JP,62-170950,A, can be added. a desirable addition -- 0.01- of a sensible-heat layer total solid -- it is 0.05 - 0.5 % of the weight still more preferably 1% of the weight

[0049] Since the negative for lithography of this invention protects the image formation layer front face

of a hydrophilic property from contamination by the lipophilic property matter at the time of preservation, or the contamination (the remains of a fingerprint) by contact of the finger at the time of handling, a hydrophilic overcoat layer can be prepared on an image formation layer.

[0050] The hydrophilic overcoat layer used for this invention can be easily removed on a printing machine, and contains the resin chosen from the water bloating tendency resin which constructed the bridge partially in the water soluble resin or the water soluble resin.

[0051] This water soluble resin is chosen from water-soluble naturally-occurring polymers and a water-soluble synthetic macromolecule, and when application dryness is used and carried out with a water-soluble-resin independent or a cross linking agent, it can carry out film formation. As an example of the water soluble resin preferably used for this invention In naturally-occurring polymers, gum arabic, water-soluble soybean polysaccharide, a fibrin derivative for example, a carboxymethyl cellulose and a carboxy ethyl cellulose -- By the synthetic macromolecule, the denaturation objects, such as a methyl cellulose, a white dextrin, a pullulan, a zymolysis etherification dextrin, etc. Polyvinyl alcohol (thing of 65% or more of adding-water cracking severity of polyvinyl acetate), A polyacrylic acid, its alkali-metal salt or an amine salt, a polyacrylic-acid copolymer, The alkali-metal salt or an amine salt, a polymethacrylic acid, its alkali-metal salt, or an amine salt, Vinyl alcohol / acrylic-acid copolymer and its alkali-metal salt, or an amine salt, A polyacrylamide, its copolymer, polyhydroxy ethyl acrylate, A polyvinyl pyrrolidone, its copolymer, a polyvinyl methyl ether, A vinyl methyl ether / maleic-anhydride copolymer, a Polly 2-acrylamide-2-methyl-1-propane sulfonic acid, The alkali-metal salt or an amine salt, a Polly 2-acrylamide-2-methyl-1-propane sulfonic-acid copolymer, its alkali-metal salt, or an amine salt can be mentioned. Moreover, according to the purpose, two or more sorts can be mixed and these resins can also be used. However, this invention is not limited to these examples.

[0052] When carrying out partial bridge formation of at least one or more sorts of a water soluble resin and forming an overcoat layer on a hydrophilic layer, bridge formation is performed by carrying out crosslinking reaction using the reactant functional group which a water soluble resin has. Even if crosslinking reaction is bridge formation of covalent-bond nature, it may be bridge formation of ionic bond nature.

[0053] Although the adhesiveness of an overcoat layer front face falls and the handling nature of the negative for lithography becomes good according to bridge formation, since an overcoat layer will change to lipophilic property and removal of the overcoat layer on a printing machine will become difficult if bridge formation progresses too much, moderate partial bridge formation is desirable. The grade of desirable partial bridge formation is a grade elution is accepted to be in 10 minutes or more, although the hydrophilic overcoat layer is not eluted and remains in [30 seconds -] 10 minutes, when the negative for printing is dipped in underwater [25-degree C].

[0054] As a compound (cross linking agent) used for crosslinking reaction, the well-known polyfunctional compound which has cross-linking is mentioned, and the poly epoxy compound, a polyamine compound, a polyisocyanate compound, the poly alkoxy silyl compound, a titanate compound, an aldehyde compound, a polyvalent-metallic-salt compound, a hydrazine, etc. are mentioned.

[0055] A cross linking agent can mix and use [independent or] two or more sorts. Among cross linking agents, although especially a desirable cross linking agent is a water-soluble cross linking agent, it can distribute and use the thing of non-water solubility for water with a dispersant.

[0056] As a combination of a desirable water soluble resin and a cross linking agent, a carboxylic-acid content water soluble resin / polyvalent metal compound, a carboxylic-acid content water soluble resin / water-soluble epoxy resin, a hydroxyl-group content resin / dialdehydes can be mentioned especially.

[0057] The suitable addition of a cross linking agent is 2 - 10% of the weight of a water soluble resin. Good water resistance is obtained without spoiling the removal nature of the overcoat layer on a printing machine within the limits of this.

[0058] In addition, in a solution application, a non-ion system surfactant can mainly be added for the purpose which secures the homogeneity of an application to an overcoat layer. As an example of such a nonionic surface active agent, sorbitan tristearate, sorbitan monopalmitate, a sorbitan trio rate, a stearin

acid monoglyceride, the polyoxyethylene nonylphenyl ether, polyoxyethylene dodecylether, etc. can be mentioned. The rate for which it accounts in the total solid of the overcoat layer of the above-mentioned nonionic surface active agent has 0.05 - 5 desirable % of the weight, and it is 1 - 3 % of the weight more preferably.

[0059] When a bridge is not constructed over the water soluble resin in the thickness of the overcoat layer of this invention, 0.1 to 4.0 micrometers are 0.1 micrometers to 1.0 micrometers, and when partial bridge formation of the water soluble resin is carried out, the desirable still more desirable range has desirable 0.1-0.5 micrometers, and is more desirable. [of 0.1-0.3 micrometers] Within the limits of this, contamination of the hydrophilic layer by the lipophilic property matter can be prevented, without spoiling the removal nature of the overcoat layer on a printing machine.

[0060] In the negative for the lithography versions of this invention as a base material which can apply the aforementioned sensible-heat layer It is a tabular object stable in dimension. For example, paper, plastics The paper (which for example, polyethylene, polypropylene, polystyrene, etc. laminated), Metal plates (for example, aluminum, zinc, copper, etc.), plastic film for example, a diacetyl cellulose, a cellulose triacetate, and a cellulose propionate -- A butanoic acid cellulose, a cellulose acetate butyrate, a cellulose nitrate, a polyethylene terephthalate, The metal like the above, such as polyethylene, polystyrene, polypropylene, a polycarbonate, and a polyvinyl acetal, is mentioned for a lamination, the paper by which vacuum evaporationo was carried out, or plastic film. Polyester film or an aluminum plate is mentioned as a desirable base material.

[0061] This aluminum plate makes a pure-aluminium board and aluminum a principal component, it is an alloy board containing the different element of a minute amount, and plastics laminates it in the thin film of aluminum or an aluminium alloy further. There are silicon, iron, manganese, copper, magnesium, chromium, zinc, a bismuth, nickel, titanium, etc. in the different element contained in an aluminium alloy. The content of the different element in an alloy is at most 10 or less % of the weight. However, the aluminum plate of a material better known than before can also be suitably used for the aluminum plate applied to this invention.

[0062] The thickness of the above-mentioned substrate used by this invention is 0.15mm - 0.3mm especially preferably 0.1mm - 0.4mm preferably 0.05mm - 0.6mm.

[0063] It is desirable to precede using an aluminum plate and to carry out surface treatment, such as split-face-izing of a front face and anodic oxidation. With surface treatment, the improvement in a hydrophilic property and adhesive reservation with a sensible-heat layer become easy.

[0064] Although split-face-ized processing on the front face of an aluminum plate is performed by various methods, it is performed by the method of split-face-izing mechanically, for example, the method of forming a front face into a dissolution split face electrochemically, and the method of carrying out the selective dissolution of the front face chemically. As the mechanical method, well-known methods, such as the ball grinding method, a brushing method, the blast grinding method, and buffing, can be used. The method of flooding with the saturated-water solution of the aluminum salt of a mineral acid which is indicated by JP,54-31187,A as the chemical method is suitable. Moreover, there is the method of performing by an alternating current or direct current in the electrolytic solution which contains acids, such as a hydrochloric acid or a nitric acid, as an electrochemical split-face-ized method. Moreover, the electrolysis split-face-ized method using the mixed acid can also be used as indicated by JP,54-63902,A.

[0065] As for split-face-izing by the method like the above, it is desirable to be given in the range from which (Ra) is set to 0.2-1.0 micrometers in the center line average coarseness of the front face of an aluminum plate. Anodizing is performed, in order that the split-face-ized aluminum plate may raise abrasion resistance by request, after alkali etching processing is carried out using solution, such as a potassium hydroxide and a sodium hydroxide, if needed and neutralization processing is carried out further. As an electrolyte used for anodizing of an aluminum plate, use of the various electrolytes which form a porosity oxide film is possible, and, generally a sulfuric acid, a hydrochloric acid, oxalic acid, chromic acids, or those mixed acids are used. The concentration of those electrolytes is suitably decided according to an electrolytic kind. Although it cannot generally specify since the processing conditions of

anodic oxidation change variously with the electrolyte to be used, if electrolytic concentration is 5-70 degrees C, current density 5 - 60 A/dm², voltage 1-100V, and a range for 10 seconds - electrolysis time 5 minutes, generally it is suitable for a 1 - 80-% of the weight solution, and solution temperature. As for the amount of oxide films formed, it is desirable 1.0 - 5.0 g/m² and that it is especially 1.5 - 4.0 g/m². [0066] the substrate which is carried out in the above surface treatment and has an anodic oxide film as a base material used by this invention -- for much more improvement of adiathermancy etc. in an adhesive property with the upper layer, a hydrophilic property, and the difficulty of becoming dirty, although you may remain as it is If needed, expansion processing of the micro pore of the anodic oxide film indicated by an application for patent No. 65219 [2000 to] and the application for patent No. 143387 [2000 to], sealing of a micro pore, surface hydrophilicity-ized processing in which it is immersed in the solution containing a hydrophilic compound, etc. can be chosen suitably, and can be performed. As a suitable hydrophilic compound for the above-mentioned hydrophilicity-ized processing, polyvinyl phosphonic acid, a compound with a sulfonic group, a saccharide compound, a citric acid, alkali-metal silicate, a zirconium fluoride potassium, phosphate / inorganic fluorine compound, etc. can be mentioned.

[0067] When using a base material with the hydrophilic property of front faces, such as polyester film, inadequate as a base material of this invention, it is desirable to apply a hydrophilic layer and to make a front face into a hydrophilic property. The hydrophilic layer which comes to apply the application liquid containing the colloid of the oxide of at least one element chosen [application for patent / No. 10810 / 2000 to] / from the beryllium, the magnesium, the aluminum, the silicon, the titanium, the boron, the germanium, the tin, the zirconium, the iron, the vanadium, antimony, and transition metals of a publication as a hydrophilic layer or a hydroxide is desirable. The hydrophilic layer which comes to apply the application liquid containing the colloid of the oxide of silicon or a hydroxide especially is desirable.

[0068] In this invention, before applying a sensible-heat layer, the organic undercoat which contains [application for patent / No. 143387 / 2000 to] / inorganic undercoat like a publication, for example, water-soluble metal salts, such as boric-acid zinc, or a carboxymethyl cellulose, a dextrin, a polyacrylic acid, etc. can be prepared if needed. Moreover, you may make this undercoat contain the aforementioned light-and-heat conversion agent.

[0069] Image formation of the negative for the lithography versions of this invention is carried out by heat. Specifically, although high illuminance flash exposure, such as direct picture Mr. record, scanning exposure by the infrared laser, and a xenon electric-discharge lamp, infrared-lamp exposure, etc. by the heat recording head etc. are used, exposure by solid-state high power infrared laser which emits infrared radiation with a wavelength of 700-1200nm, such as semiconductor laser and an YAG laser, is suitable.

[0070] A printing machine can be equipped without processing beyond it with the negative for the lithography versions of this invention by which picture exposure was carried out, and it can be printed in the usual procedure using ink and dampening water.

[0071] Moreover, the negative for the lithography versions of this invention by which picture exposure was carried out As a method of the simple lithography which does not use dampening water, for example, JP,49-26844,B, JP,49-27124,B, JP,49-27125,B, JP,53-36307,A, JP,53-36308,A, JP,61-52867,B, JP,58-2114844,A, JP,53-27803,A, JP,53-29807,A, JP,54-146110,A, The lithography using emulsion ink given in JP,57-212274,A, JP,58-37069,A, JP,54-106305,A, etc. is also possible.

[0072] Moreover, it is also possible to expose these negatives for the lithography versions with the laser carried in the printing machine after attaching on a printing machine cylinder as indicated by patent No. 2938398, and to carry out on-board development after that. Moreover, after these negatives for the lithography versions carry out development which makes water or suitable solution a developer, they can also be used for printing.

[0073]

[Example] Although an example explains this invention still more concretely below, of course, the range of this invention is not limited by these.

[0074] [A synthetic example]

(A monomer, composition of M-1) It was dropped at sulfanilamide 86g, pyridine 79g, N, and N-

dimethylacetamide 200ml mixture, ice-cooling chloro carbonic acid phenyl 75g. After the dropping end, after carrying out overnight stirring at a room temperature, it flowed into hydrochloric-acid acid underwater one, and the crystal which deposits was filtered. By recrystallizing [ethyl acetate], p-FENOKISHIROKISHI carbonylamino phenyl sulfonamide was obtained as a white crystal. Yield of 132g.

[0075] It was dropped at p-FENOKISHIROKISHI carbonylamino phenyl sulfonamide 54.4g [which was obtained above], triethylamine 40g, N, and N-dimethylamino pyridine 2g, N, and N-dimethylacetamide 150ml mixture, ice-cooling methacrylic-acid chloride 22.8g. After the dropping end, it poured underwater and the crystal which deposits was filtered, after stirring for 2 hours. By recrystallizing [ethyl acetate / toluene-/ (3/7)], N-(p-phenoxy carbonylamino phenyl sulfonyl) methacrylamide (M-1) was obtained as a white crystal. Yield of 40g. 190-193 degree C of mp(s).

[0076] (Composition of polymer P-1) After dissolving styrene 5.2g and methacrylic-acid 2-(O-[1'-MECHIRUPUROPIRIDENAMINO] KARUBOKISHIRUAMINO) ethyl (MOI-BM; Showa Denko K.K. make) 12.1g in 300ml 3 mouth round bottom flask equipped with the capacitor and the agitator at methyl-ethyl-ketone 35.2g and heating at 70 degrees C under a **** air current, V-60:0.4 g is added as an initiator, and it is with 70 degrees C. Polymerization reaction was performed for 8 hours. after a reaction end and reaction mixture -- a room temperature -- cooling -- a methyl ethyl ketone -- 50 moreg - adding -- reaction mixture -- diluting -- this reaction mixture -- n-hexane 1500ml -- in addition, white polymer was deposited, stirring to inside This polymer was discriminated and 14g white polymer was obtained by making it dry under a vacuum after washing by n-hexane. Weight average molecular weight was 26,000.

[0077] (Composition of polymer P-2) It warmed at 65 degrees C, having melted the above-mentioned monomer (M-1) 14.6g and methyl methacrylate 16.3g to dimethylacetamide 93g, and stirring it under a nitrogen air current. 2 and 2'-azobis (2, 4-dimethyl PARERO nitril) 45mg was added. 2 and 2'-azobis (2, 4-dimethyl PARERO nitril) 45mg was added 2 hours after, and further 2 and 2'-azobis (2, 4-dimethyl PARERO nitril) 99mg was added 2 more hours after. After continuing stirring at 65 degrees C for 2 hours, it cooled to the room temperature. After adding acetone 50ml to reaction mixture, it poured into water 2L and the depositing solid-state was dried after **** and rinsing. Weight average molecular weight was 20,000.

[0078] (Manufacture of polymer particle distribution liquid (1)) To the 3000ml three necked flask, 9.2g of sodium dodecyl sulfates and 1350ml of distilled water were stirred for 10 minutes under *****, 75 degrees C, and the **** air current. Styrene 52g and methacrylic-acid 2-(O-[1'-MECHIRUPUROPIRIDENAMINO] KARUBOKISHIAMINO) ethyl (MOI-BM; Showa Denko

[K.K.] make) after adding the solution which mixed 0.462g of potassium persulfate, distilled water:11.3ml, and 3.42ml of 1M sodium-hydrogencarbonate solution to this solution: The 121g mixed solution was dropped over 3 hours. 0.462g of potassium persulfate, 14.2ml of distilled water, and the solution that mixed 3.42ml of 1M sodium-hydrogencarbonate solution were further added after the dropping end, and stirring was continued for 3 hours. It cooled to the room temperature, the obtained reaction mixture was filtered with the glass filter, and latex solution was obtained. In this way, the solid-content concentration of the obtained latex solution was 11.3 % of the weight, and the mean particle diameter of a latex was 40nm.

[0079] (Manufacture of polymer particle distribution liquid (2)) To the 2000ml three necked flask, 9.2g of sodium dodecyl sulfates and 1200ml of distilled water were stirred for 10 minutes under *****, 75 degrees C, and the **** air current. After adding 0.462g of potassium persulfate, 11.3ml of distilled water, and the solution that mixed 3.42ml of 1M sodium-hydrogencarbonate solution to this solution, styrene 104g was dropped at it over 3 hours. 0.462g of potassium persulfate, 14.2ml of distilled water, and the solution that mixed 3.42ml of 1M sodium-hydrogencarbonate solution were further added after the dropping end, and stirring was continued for 3 hours. It cooled to the room temperature, the obtained reaction mixture was filtered with the glass filter, and latex solution was obtained. In this way, the solid-content concentration of the obtained latex solution was 11 % of the weight, and the mean particle diameter of a latex was 40nm.

[0080] (Manufacture of polymer particle distribution liquid (3)) P-1:2.32 g polymer and A-41C(product made from Takemoto Fats and oils) 0.07g of anionic surface active agent pie ONIN were dissolved in methyl-ethyl-ketone 6g and 12g mixed liquor of ethyl acetate, and the oil phase was produced. The aqueous phase of 8.07g of 4% of polyvinyl alcohol (PVA205 by Kuraray Co., Ltd.) solution was added to this, and it was made to emulsify for 10 minutes by 15000rpm with a homogenizer. After adding 39.78g for water, this liquid was heated flying the organic solvent at 40 degrees C for 3 hours. When solid-content concentration was measured, it was 5.4 % of the weight. Moreover, the mean particle diameter was 0.3 micrometers.

[0081] (Manufacture of polymer particle distribution liquid (4)) methyl-ethyl-ketone 6g and 12g mixed liquor of ethyl acetate -- P-1:1.84 g polymer and a light-and-heat conversion agent (IR-31 [given / this / in a specification]) -- 0.48g and A-41C(product made from Takemoto Fats and oils) 0.07g of anionic surface active agent pie ONIN were dissolved, and the oil phase was produced The aqueous phase of 8.07g of 4% of polyvinyl alcohol (PVA205 by Kuraray Co., Ltd.) solution was added to this, and it was made to emulsify for 10 minutes by 15000rpm with a homogenizer. After adding 39.78g for water, this liquid was heated flying the organic solvent at 40 degrees C for 3 hours. When solid-content concentration was measured, it was 5.4 % of the weight. Moreover, the mean particle diameter was 0.33 micrometers.

[0082] (Manufacture of polymer particle distribution liquid (5)) methyl-ethyl-ketone 6g and 12g mixed liquor of ethyl acetate -- P-2:1.84 g polymer and a light-and-heat conversion agent (IR-27 [given / this / in a specification]) -- 0.48g and anionic surface active agent pie ONIN A-41C(product made from Takemoto Fats and oils) 0.07g was dissolved, and the oil phase was produced. The aqueous phase of 8.07g of 4% of polyvinyl alcohol (PVA205 by Kuraray Co., Ltd.) solution was added to this, and it was made to emulsify for 10 minutes by 15000rpm with a homogenizer. After adding 39.78g for water, this liquid was heated flying the organic solvent at 40 degrees C for 3 hours. When solid-content concentration was measured, it was 5.4 % of the weight. Moreover, the mean particle diameter was 0.33 micrometers.

[0083] (Manufacture of polymer particle distribution liquid (6)) Weight-average-molecular-weight 25000 polystyrene:2.32g and A-41C(product made from Takemoto Fats and oils) 0.07g of anionic surface active agent pie ONIN were dissolved in methyl-ethyl-ketone 6g and 12g mixed liquor of ethyl acetate, and the oil phase was produced. The aqueous phase of 8.07g of 4% of polyvinyl alcohol (PVA205 by Kuraray Co., Ltd.) solution was added to this, and it was made to emulsify for 10 minutes by 15000rpm with a homogenizer. After adding 39.78g of water, this liquid was heated flying the organic solvent at 40 degrees C for 3 hours. When solid-content concentration was measured, it was 5.4 % of the weight. Moreover, the mean particle diameter was 0.33 micrometers.

[0084] (Manufacture of polymer particle distribution liquid (7)) methyl-ethyl-ketone 6g and 12g mixed liquor of ethyl acetate -- polystyrene (weight average molecular weight 25000) 1.84g and a light-and-heat conversion agent (IR-31 [given / this / in a specification]) -- 0.48g and anionic surface active agent pie ONIN A-41C(product made from Takemoto Fats and oils) 0.07g was dissolved, and the oil phase was produced. The aqueous phase of 8.07g of 4% of polyvinyl alcohol (PVA205 by Kuraray Co., Ltd.) solution was added to this, and it was made to emulsify for 10 minutes by 15000rpm with a homogenizer. After adding 39.78g for water, this liquid was heated flying the organic solvent at 40 degrees C for 3 hours. When solid-content concentration was measured, it was 5.4 % of the weight. Moreover, the mean particle diameter was 0.33 micrometers.

[0085] (Example of manufacture of a base material) The aluminum plate of 0.3mm in thickness and the quality of the material JIS A 1050 was often washed with water, after graining the front face using the water suspension of a No. 8 nylon brush and PAMISUTON of 800 meshes. After etching by dipping this board in sodium-hydroxide solution for 60 seconds at 70 degrees C 10%, it rinsed with the stream, and neutralization washing was carried out with the nitric acid 20 more%, and, subsequently it rinsed. Quantity of electricity performed electrolysis split-face-ized processing for this in 1% nitric-acid solution using the police box wave current of a sine wave at the time of the anode plate of 300 C/dm² under the conditions of Va=12.7V. When the surface roughness of an aluminum plate was measured, it

was 0.45 micrometers (Ra display). After DESUMATTO [being successingly immersed into 30% sulfuric-acid solution and / 55 degrees C] for 2 minutes, direct-current electrolysis was carried out for 45 seconds with the current density of 5 A/dm² in 33 degrees C and 15% sulfuric acid, and the anodic oxide film was formed. In order to expand the micro pore of the generated anodic oxide film, after being immersed for 1 minute into 60-degree C 50 g/l sulfuric acid, further, it processed for 12 seconds, 70 degrees C carried out rinsing dryness in the 2.5 % of the weight solution of sodium silicates, and the base material was obtained.

[0086] [Example 1] After adjusting the following sensible-heat layer application liquid (1) on the base material obtained in the above-mentioned example of manufacture, the bar application was carried out, it dried on 60 degrees C and the conditions for 120 seconds in oven, and the original edition for the lithography versions of dryness coverage 0.8 g/m² of a sensible-heat layer was produced.

[0087]

(Sensible-heat layer application liquid (1))

Polymer particle distribution liquid (1) 20g PVA205(Kuraray Co., Ltd. make) 4% solution 7.75g Light-and-heat conversion agent (IR-10 [given / this / in a specification]) 0.34g Distilled water 26.5g. [0088] Do in this way. In Trendsetter3244VFS made from Greo which carried water cooling type 40W infrared semiconductor laser for the obtained original edition for the lithography versions, after attaching in the cylinder of printing machine SOR-M made from high DERUBERUGU and supplying dampening water, without carrying out a development after exposing on condition that output 9W, outside drum rotational frequency 210rpm, printing plate energy 100 mJ/cm², and resolution 2400dpi, it printed by supplying ink and supplying paper further. Consequently, on-board development could be carried out satisfactory and it was able to print to 6,000 sheets.

[0089] [Example 2] Except having changed the PVA205(Kuraray Co., Ltd. make) 4% solution of the sensible-heat layer application liquid (1) of an example 1 into 4% (weight average molecular weight 25,000) solution of polyacrylic acids, preparation and the original edition for the lithography versions were similarly created for sensible-heat layer application liquid (2), and exposure and printing were carried out on these conditions. Consequently, on-board development could be carried out satisfactory and it was able to print to 4,000 sheets.

[0090] [Example 3] After adjusting the following sensible-heat layer application liquid (3) on the base material created by the same manufacture method as an example 1, the bar application was carried out, it dried on 60 degrees C and the conditions for 120 seconds in oven, the original edition for the lithography versions of dryness coverage 0.8 g/m² of a sensible-heat layer was produced, and exposure and printing were carried out on an example 1 and these conditions.

[0091]

(Sensible-heat layer application liquid (3))

Polymer particle distribution liquid (3) 20g Light-and-heat conversion agent (IR-10 [given / this / in a specification]) 0.34g. [0092] Consequently, on-board development could be carried out satisfactory and it was able to print to 5,000 sheets.

[0093] [Example 4] Polymer particle distribution liquid (4) was used as sensible-heat layer application liquid (4) on the base material produced by the same manufacture method as an example 1, the bar application was carried out, it dried on 60 degrees C and the conditions for 120 seconds in oven, and the original edition for the lithography versions of dryness coverage 0.8 g/m² of a sensible-heat layer was produced. Exposure and printing were carried out on an example 1 and these conditions. Consequently, on-board development could be carried out satisfactory and it was able to print to 12,000 sheets.

[0094] [Example 5] Except having changed the polymer particle distribution liquid in the sensible-heat layer application liquid of an example 4 (4) into polymer particle distribution liquid (5), preparation and the original edition for the lithography versions were completely similarly created for sensible-heat layer application liquid (5), and exposure and printing were carried out on these conditions. Consequently, on-board development could be carried out satisfactory and it was able to print to 10,000 sheets.

[0095] [Example 6] After adjusting the following sensible-heat layer application liquid (6) on the base material created by the same manufacture method as an example 1, the bar application was carried out, it

dried on 60-degree-C conditions for 120 seconds in oven, the original edition for the lithography versions of dryness coverage 0.8 g/m² of a sensible-heat layer was produced, and exposure and printing were carried out on an example 1 and these conditions. Consequently, on-board development could be carried out satisfactory and it was able to print to 20,000 sheets.

[0096]

(Sensible-heat layer application liquid (6))

Polymer particle distribution liquid (4) 20g Diethylenetriamine (5.4% solution) 1.17g. [0097] [Example 1 of comparison] Except having changed the polymer particle distribution liquid (1) in the sensible-heat layer application liquid (1) of an example 1 into polymer particle distribution liquid (2), preparation and the original edition for the lithography versions were completely similarly created for sensible-heat layer application liquid (7), and exposure and printing were carried out on these conditions. Consequently, although on-board development was able to be carried out satisfactory, the number of sheets which can be printed was as inadequate as 1,000 sheets.

[0098] [Example 2 of comparison] Except having changed the polymer particle distribution liquid (3) in the sensible-heat layer application liquid (3) of an example 3 into polymer particle distribution liquid (6), preparation and the original edition for the lithography versions were completely similarly created for sensible-heat layer application liquid (8), and exposure and printing were carried out on these conditions. Consequently, although on-board development was able to be carried out satisfactory, the number of sheets which can be printed was as inadequate as 1,500 sheets.

[0099] [Example 3 of comparison] Except having changed the polymer particle distribution liquid (4) in the sensible-heat layer application liquid (4) of an example 4 into polymer particle distribution liquid (7), preparation and the original edition for the lithography versions were completely similarly created for sensible-heat layer application liquid (9), and exposure and printing were carried out on these conditions. Consequently, although on-board development was able to be carried out satisfactory, the number of sheets which can be printed was as inadequate as 2,000 sheets.

[0100] [Example 4 of comparison] After adjusting the following sensible-heat layer application liquid (10) on the base material obtained by the same manufacture method as an example 1, the bar application was carried out, it dried on 60-degree-C conditions for 120 seconds in oven, and the original edition for the lithography versions of dryness coverage 0.8 g/m² of a sensible-heat layer was produced. Although exposure and printing were carried out on an example 1 and these conditions, poor on-board development nature arose and good printed matter was not obtained.

[0101]

(Sensible-heat layer application liquid (10))

Polymer particle distribution liquid (1) 20g Light-and-heat conversion agent (IR-10 [given / this / in a specification]) 0.34g Distilled water 28.4g. [0102] Although each original edition for the lithography versions of the examples 1-6 of this invention obtained the result which on-board development nature is good, and ****-proof should be [the result] excellent and satisfy so that clearly from the above-mentioned result, each original edition for the lithography versions of the examples 1-4 of comparison was a dissatisfied result in a certain property.

[0103]

[Effect of the Invention] As explained above, the platemaking by the scanning laser exposure and on-board development based on digital exposure is possible for the original edition for the lithography versions of this invention, the polymer particle contained in a sensible-heat layer carries out heat weld partially at least with the heat generated by irradiation of laser exposure, and the blocking agent of the blocking isocyanate simultaneously contained in a polymer molecule dissociates it. The polymer which has the isocyanate machine which separated produces crosslinking reaction with self-bridge formation or a hydrophilic resin, and its picture section intensity improves. The above-mentioned result, the unexposed section holds good on-board development nature, and the picture section can offer the original edition for the lithography versions which was excellent in ****-proof.

[Translation done.]